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"Prospecting in the North." By HORACE V. WINCHELL. *The Mining Magazine*, Vol. III, No. 6, p. 436. December, 1910.

The writer compares the sulphide ore deposits of the western part of the United States and Mexico with those of British Columbia and Alaska and notes the differences in the operations of the processes of superficial alteration and secondary enrichment in the different latitudes. In the more northern deposits the metals have not migrated in cold solutions so extensively, because the colder climatic conditions are less favorable. Further, the secondary ores, where found, have generally been planed off by ice erosion.

Since glacial times, at some places, a kind of secondary sulphide enrichment has taken place at the very surface, but generally this amounts to little more than a veneer or varnish on the lower-grade material. His conclusions, applied to deposits of sulphide ores of copper, silver, lead, and to some extent, of gold, are: "(1) Boreal regions seldom contain rich and extensive deposits of secondary ore. (2) The surface appearance is often deceptive, and if the ore is high grade, sudden decrease in value may be expected at limited depth. (3) Where large deposits of *primary ore* are found in glaciated regions, these are likely to extend downward." In the temperate zone, "(1) Deep superficial alteration and complete oxidation of vein-matter is a common phenomenon in warm countries and is indicative of good ore below; (2) In general, ore deposits are more abundant in the warm and temperate zones; and (3) They are not so likely to terminate suddenly or change rapidly in depth."

W. H. E.

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*Geological and Archaeological Notes on Orangia.* By J. P. JOHNSON. London: Longmans, Green & Co., 1910. Pp. 99.

This volume contains chapters on Stratigraphy, Kimberlite Dikes and Pipes, Diamond Mines, and Superficial Deposits and Pans.

Almost the whole surface is made up of nearly horizontal beds belonging to the Karoo System, with comparatively small outcrops of older formations along the Vaal River. In the area best exposed these older beds dip away from a central core of granite and are overlain unconformably by the Karoo.

The lowest of the Karoo beds is the Dwyka series, which is described as a band of boulder shale. The underlying rocks wherever exposed are polished and present the characteristic contours of a glaciated country.

The evidence of the striations indicates a general movement of the ice from northeast to southwest. The Eccla or Beaufort series, consisting of fifteen hundred feet of sandstone and shale, occupies most of the surface, while the Stormberg series is found along the eastern border.

The whole area of Orangia has been intruded by a network of basic dikes and sills of nearly the same composition, and at a later date by the veinlike pipes and dikes of the diamond-bearing rock. This rock, which is known as Kimberlite, has a wide distribution in Orangia, filling both narrow fissures and vents or pipes. Its nature is as yet imperfectly known, some occurrences giving the impression of a consolidated igneous rock, others being apparently purely fragmental. The author thinks that the typical fissure Kimberlite is a magmatic intrusion, and that the pipes were originally filled, perhaps on more than one occasion, with a magma, which, except near the depth of origin, must have had a very low temperature for an igneous extrusion and which, after solidification, was smashed up by frequently repeated explosions.

E. R. L.

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*The Slates of Arkansas.* By A. H. PURDUE, with a Bibliography of the Geology of Arkansas by J. C. BRANNER. Geological Survey of Arkansas, 1909. Pp. 164.

The part of this volume which is of greatest general interest is chap. iii, which deals with the geology of the slate area. This area includes the part of the Ouachita Mountains from Little Rock westward for about one hundred miles. The sedimentary rocks of known age are of Ordovician and Carboniferous (Pennsylvanian) age, with rocks of unknown age both above and below the Ordovician.

Above the rocks of known Ordovician age is a group of three formations of which the well-known Arkansas novaculite is the middle member. In a former publication of the Survey these were all classed as Ordovician, but the author finds no proof of this and thinks that they may be Ordovician, Silurian, or Carboniferous.

The region is one of intense folding, and thrust faulting is quite common.

E. R. L.

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*Geological Survey of Georgia.* Bull. No. 23, "Mineral Resources." By S. W. MCCALLIE, State Geologist. Pp. 208.

The introductory chapter on the geology of the state is brief and presents no new facts. The descriptions of the mineral deposits are arranged alphabetically, the general distribution, the mode of occur-